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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/735,543	12/12/2003	Chang-Dong Feng	R290.12-0029	2721

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EXAMINER	
DEB, ANJAN K	

ART UNIT	PAPER NUMBER
2858	

DATE MAILED: 08/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/735,543	FENG ET AL.	
	Examiner	Art Unit	
	Anjan K. Deb	2858	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 2, 4-8, 10-12, 16-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Jewell (US 5,367,911).

Re claims 1, Jewell discloses flow through conductivity sensor comprising flow conduit 126 (Fig. 10), first 122 and second 124 electrodes disposed relative to the flow conduit to contact process fluid proximate the conduit, current return conductor 134 (Fig. 10) coupled to first 122 and second 124 electrodes, and toroid 132 (transformer) arranged to interact with current return conductor 134 to provide an indication (output signal from line 136) of process fluid conductance (column 9 lines 56-68, column 10 lines 1-10).

Re claims 2, 4, 5 Jewell discloses at least one toroid is configured as a transformer 132 having a pair of windings disposed about the current return conductor 134 and one winding (transformer secondary coil) is connected in series with the return conductor 134 (Fig. 10).

Re claims 6, 8 Jewell disclose first and second electrodes formed by contact ring (circumferential electrodes)(column 8 lines 1-4).

Re claim 7, Jewell discloses second electrode includes a conductive process pipe (casing lining a borehole)(column 9 lines 57-60).

Re claim 10, Jewell discloses method of measuring conductivity of a process fluid in a flow conduit (Fig. 10), the method comprising: contacting the process fluid with first 122 and second 124 electrodes coupled together by a current return path 134, generating an electrical current in the process fluid with a drive toroid (transformer) 132 and measuring current through the current (I) return path (current I is proportional to current in return conductor 134).

Re claims 11-12, Jewell discloses measuring/generating includes coupling receive/drive toroid (transformer) 132 to return current path 134.

Re claim 16, Jewell disclose system for measuring conductivity of process fluid process piping having a conductive inner surface and a pair of ends (Fig. 10), the system comprising a first electrode coupled to one of the pair of ends, the first electrode being electrically coupleable to the process fluid, a second electrode 122 electrically coupleable to the process fluid and electrically isolated from the pair of pipe ends, and means (130)(132) for generating a current within the process fluid, and means (I) (136) for measuring the generated current to provide an indication of conductivity.

Re claims 17-19, Jewell discloses the means (130)(132) for generating and measuring includes a toroid (132) wherein the toroid is configured as a transformer.

Re claim 20, Jewell discloses the means for generating includes means for directly measuring conductivity using the two electrodes (124)(122).

Re claim 21, Jewell disclosed second electrode (122) is a contact ring (circumferential electrodes)(column 8 lines 1-4).

3. Claim 14 is rejected under 35 U.S.C. 102(b) as being anticipated by Montaron et al. (EP 2,607,249).

Re claim 14, Montaron et al. disclose method of measuring conductivity using a flow-through conductivity sensor, the method comprising generating a current in a process fluid using at least two electrodes (1)(2), selecting a measurement regime for measuring the generated current (selecting a frequency F)(page 5, lines 21-25), measuring (4)(5) the current with the selected measurement regime, and providing an indication of conductivity based upon the measured current. (Montaron et al. measures the voltage between electrodes 4,5, and it is clear to the examiner that the current I is related to the voltage V by the relation $I = V \cdot \sigma$, where σ is fluid conductivity).

4. Claims 14,15 are rejected under 35 U.S.C. 102(b) as being anticipated by Brown et al. (US 5,455,513).

Re claims 14,15 Brown et al. discloses method of measuring electrical conductivity of fluid using a conductivity sensor, the method comprising generating (19) a current in a process

(column 2 lines 48-51) fluid using at least two electrodes (terminals)(4-terminal bridge 18')(contacting sensors)(column 1 lines 17-20, column 6 lines 37-41), selecting a measurement regime (microprocessor selects appropriate range)(column 4 lines 47-50) with a switch (S2)(switching multiplier 27) for measuring the generated current (in bridge 18') with the selected measurement regime, and providing an indication of conductivity based upon the measured current (microprocessor provides desired conductivity value)(column 2 lines 5,6).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claim 3, is rejected under 35 U.S.C. 103(a) as being unpatentable over Jewell (US 5,367,911) in view of Rosenthal (US 3,404,336).

Re claim 3, Jewell disclosed all of the claimed limitations as set forth above including a first drive toroid and return conductor except a second toroid disposed about the current return conductor.

Rosenthal discloses an apparatus (Fig. 1) and method for measuring electrical conductivity of a fluid comprising a second toroid (22) for measuring current (*i*) in fluid in conduit 13 (column 2 lines 1-27).

At the time the invention was made it would have been obvious for one of ordinary skill in the art to modify Jewell by adding a second toroid disclosed by Rosenthal for measuring

current in the return conductor so that the first toroid is used for driving and the second toroid used for measuring the current in the fluid so as to isolate the drive circuit from the measurement circuit to achieve greater accuracy by minimizing the effects of noise that may be generated in the drive circuit.

7. Claims 9, 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jewell (US 5,367,911).

Re claims 9, 22 Jewell disclosed first (122) and second (124) electrodes includes a metal pipe (Fig. 10) disposed between a pair of insulating pipes (column 9 lines 57-60), but did not expressly disclose each insulating pipe includes insulating ends and an insulating liner, but would have been obvious for providing the required electrical insulation between the two electrodes (122)(124).

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Jewell by adding pair of insulating pipes each insulating pipe having insulating ends and an insulating liner for achieving the required level of electrical insulation between electrodes.

8. Claim 15, is rejected under 35 U.S.C. 103(a) as being unpatentable over Montaron et al. (EP 2,607,249).

Re claim 15, Montaron et al. disclosed all of the claimed limitations as set forth above except selecting a measurement regime by using an electrical switch.

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Jewell by adding a switch for selecting a particular oscillator frequency (F) for the selected measurement regime.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

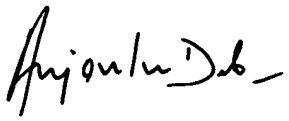
Danyluk et al. (US 2002/0140564) discloses (Fig. 3) measuring conductivity (dielectric properties) of fluid in conduit 50 comprising generating a current (A) in a process fluid using at least two electrodes (60)(65) and selecting a measurement regime with a switch (Fig. 4).

Response to Arguments

9. In response to applicant's arguments that Jewell does not disclose conductivity measurement of the fluid which is reported to the user, applicant is kindly referred to Jewel's disclosure (column 3 lines 36-42) wherein it is clearly stated that the sensor includes conductivity sensor and producing conductivity measuring output signal (column 7 lines 17-18). With respect to applicant's arguments that there is no indication that current flows between electrode 124 and current sensing electrode 122, applicant is kindly referred to Fig. 10 wherein it is clearly shown that these two electrodes are connected by conductor to the secondary coil 134 of transformer 132 while current (I) flows in the primary 136. Therefore, it is clear to the examiner that current flows between electrode 124 and the current sensing electrode 122.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Anjan K. Deb whose telephone number is 571-272-2228. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lefkowitz Edwards can be reached at 571-272-2180.



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